MERCURY.

The "Twinkler" Passes Over the Face of the Sun.

TELESCOPES AT A PREMIUM.

How the Astronomers Watched the Transit.

WORK OF THE FRENCH COMMISSION.

Clouds and Haziness Obscuring the Sun.

GENERAL RESULTS SATISFACTORY.

THE OBSERVATIONS BY THE FRENCH ASTRONOMICAL COMMISSION AT OGDEN, UTAH—CLOUDS OBSCURING THE SKY AT THE EARLY STAGES—THE EGRESS SATISFACTORILY OBSERVED.

[BY TELEGRAPH TO THE HERALD.]

OGDEN, Utah, May 6, 1878.

At five A. M. to-day the sky was cloudy but not altogether unfavorable for the observations for the transit of Mercury to be made here to-day, and the representative of the HERALD repaired to the Astronomical Observatory built in 1873 by Lieutenant Wheeler, which the French astronomers had selected for their operation. The observers are Professor Charles Andre, of the Observatory at Lyons; Professor Alfred Angot, of the Lycée Fontanes, Paris, and Mons. Philippe Hatt, of the French coast survey. Professor Angot conducts his observations with a six-inch photo-lithograph equatorial in the dome of the building; the other two gentlemen observe in a temporary building with six-inch equatorials of improved construction. A heliostat with photographic apparatus is also brought into requisition. The representative of the HERALD was kindly permitted to witness the observations. At six A. M. the clouds thickened and at forty-one minutes after seven snow began to fall in flakes.

THE TRANSIT.

The transit of Mercury began at 7h. 44m. 43s., but owing to the unfavorable atmospheric conditions the ingress exterior and interior contact were only imperfectly observed. At half-past one P. M. the clouds consolidated and by two P. M. Professors Andre and Angot were busily engaged in photographing the progress of the transit. The HERALD representative had an opportunity to observe the phenomena. The body of Mercury as it appears on the sun's disk is not black as that of Venus, but a water blue. At 3h. 15m. 26s. the egress took place by inner contact, and at 3h. 18m. 34s. the phenomena was over. Seventy-eight photographic negatives by photo-lithograph and heliostat were produced. The observations for egress were satisfactory and Professor Andre expresses himself satisfied with the result.

The sky cleared about noon. Only three photographs were taken up to one o'clock P. M., after which time seventy-five photographs were taken till the time of evit, which was at seventeen minutes past three P. M. The observations are regarded as successful and satisfactory.

OBSERVATIONS IN TEXAS.

[BY TELEGRAPH TO THE HERALD.]

AUSTIN, May 6, 1878.

The transit of Mercury began at four minutes past ten o'clock and ended at twenty-one minutes of six P. M., Washington time. The first and second contacts were lost in clouds drifting. The weather was cloudy all day. The polar and Equatorial diameters of Mercury were measured and found equal. No aurora around planet and no satellite was seen. The third and fourth contacts were well observed. No black drops were observed.

OBSERVATIONS MADE AT WASHINGTON.

WASHINGTON, May 6, 1878.

According to the observations of Professor Newcomb and his assistants the second internal contact of Mercury with the western edge of the sun occurred at thirty-three minutes fifty seconds past five o'clock this afternoon, and the external contact two minutes and fifty seconds later. The planet through the telescope appeared not larger than a silver five-cent piece. Gentlemen engaged in the work say there could not have been a better day for the observations. Professor Eastman was at the old telescope at the National Observatory, and Professor Hall superintended the taking of photographs of the passing planet. These photographs were produced by means of the horizontal telescope and reflector.

Observations of the second and third interval contacts of Mercury will be made last this afternoon. The Naval Observatory will not be prepared to furnish any information or an official report of the transit until to-morrow, it being necessary to first make computations for the adjustment of time.

The transit of Mercury, in addition to being observed at the Naval Observatory, was also observed by Professor Newcombe and several of his assistants, who were provided with telescopes at the *Nautical Almanac* office. The observation fully confirmed the various results for the motion of the perihelion of Mercury. The internal contact was noted by Professor Newcomb at 7 minutes 43 seconds past ten o'clock this morning, only ten seconds earlier than the time represented by various tables.

OBSERVATIONS AT CAMBRIDGE, MASS.—THE TRANSIT CAREFULLY FOLLOWED BY A LARGE STAFF OF ASTRONOMERS.

[BY TELEGRAPH TO THE HERALD.]

CAMBRIDGE, May 6, 1878.

The observations at Harvard to-day of the transit of Mercury were very successfully made, the clearness of the day facilitating the photographing and recording, and when all calculations shall have been completed it is expected that valuable additions will be made to the scientific data of the day. The transit began at 10h. 37m. A. M. At 10h. 30m. the shadow engulfed the earth. While the planet was upon the disk an attempt was made to discover whether Mercury was fringed with a ring of light just before touching the sun, and whether this ring appeared as a bright or dark circle round the planet. When fully on the solar disk and also to note one or more bright spots if there are any, upon Mercury, photographs were taken at stated intervals by Mr. Arthur Searle, assisted by Mr. Hudson and others. The contacts were observed on the west equatorial by Professor Pickering, at the east equatorial by Mr. Waldo, and with smaller glasses by Messrs. W. Upton, C. H. Metcalf and others. The transit at noon was observed on the meridian diameter by Professor William A. Gray.

Over sixty photographs were obtained, mostly after three o'clock. Between five and six hundred measurements of the diameter of the planet were noted, but the records of time in transit are not yet worked out. No appreciable variation from the time anticipated is expected to result from the figures.

In the afternoon a clear sky afforded a most favorable opportunity for observation. The contact took place several seconds later than 10:26 A. M. The general results are considered quite satisfactory.

AT AMHERST COLLEGE, MASS.—FAIR WEATHER AND MODERATE SUCCESS.

AMHERST, Mass., May 6, 1878.

The result of the observations at the College observatory upon to-day's transit of Mercury was as favorable as the weather would permit. The first contact was not taken, but accurate measurements of the planet's position were made and the exact time recorded. Photographs were taken during the planet's course, and the last contact—internal and external—was also obtained. Noon signals from Washington to Amherst are to be continued until next Saturday, and it is expected that the longitude of Amherst will be determined with exactness. The work was done by Professor Esty, assisted by G. W. Stearns and E. K. Herbert, of the senior class.

WATCHING THE TRANSIT AT THE NAVAL ACADEMY, ANNAPOLIS, MD.

[BY TELEGRAPH TO THE HERALD.]

ANNAPOLIS, May 6, 1878.

Commander John A. Howell, assisted by Lieutenant Commanders A. D. Brown and C. G. Bowen, made observations to day at the Naval Academy observatory on the transit of Mercury. Commander Howell took the first contact of Mercury with the disk of the sun and then the differences of the declination between the limbs of the sun and Mercury by the micrometer. The observations are still in progress, and will end with the final passage of the sun. Three instruments were at work during the transit. The weather was most favorable for the observations, the results of which will be forwarded to the United States Observatory at Washington. Owing to the motion of Mercury with the sun, the little planet that seemed no larger than a pin's head when viewed through the big telescope at the Academy appeared on a mad race to cross the sun's lurid disk, while really it was making a slow march over the face of the greater light.

Commodore J. A. Howell, head of the department of astronomy at the Naval Academy, furnishes the Associated Press the following report of his observation of the transit of Mercury to-day:—

The following were the Washington times as observed with the United States Naval Academy refractor, 9 feet focal length, 8-inch aperture, power of eye piece, 212:—Ingress, exterior contact, 10 hours, 7 minutes, 3 seconds; ingress, interior contact, 10 hours, 10 minutes, 3 seconds; egress interior contact, 5 hours, 34 minutes, 3 seconds; egress exterior contact, 5 hours, 36 minutes, 39 seconds.

UNFAVORABLE WEATHER IN NEW HAMPSHIRE.

HANOVER, May 6, 1878.

The weather here is unfavorable to good observation of the transit of Mercury, cross currents in the air causing a haziness, and only occasional good views are obtained. Mr. Paul will not make any close calculations until after his return to Washington. The first contact with the sun took place at 10h. 23m. 26s. A. M. The second contact was not determinable. The weather this afternoon encourages the hope that more desirable measurements may be made. Professors Quimby, Emerson and Pattee are also taking observations. There is a large number continually present to view the planet when it is to be seen.

Both contacts of Mercury with the sun were observed this morning (instead of one as first reported), they being 2m. 50s. apart. There was a clearer sky this afternoon, though it was cloudy when it was necessary to take most of the observations. At half-past four o'clock, when the declinations of the sun and Mercury were the same, an attempt was made to determine the difference of right ascension of the two by transits of limbs of the sun and Mercury; but, though the sky was clear, the air was unsteady and observations were of little value. At the close of the transit the internal contact occurred at 5h. 53m. 13s., the external contact being 2m. 32s. later.

SUCCESSFUL OBSERVATIONS AT HAMILTON COLLEGE—INDICATIONS OF AN ATMOSPHERE AROUND MERCURY.

UTICA, N. Y., May 6, 1878.

Professor Peters, of Hamilton College, Clinton made successful observations of the transit of Mercury to-day. Clouds interfered somewhat with the observation of the internal contact. Professor Peters is of opinion that he discovered indications of an atmosphere on the planet.

VASSAR ASTRONOMERS WATCHING MERCURY.

POUGHKEEPSIE, N. Y., May 6, 1878.

The students of the astronomy class at Vassar College took seven photographs of the transit of Mercury to-day at the following named hours:—10:40 and 11:52 A. M., and 12:14, 12:52, 1:03, 1:21 and 1:36 P. M. The first indentation upon the sun's disk was splendidly seen, and as the planet passed along some of the students noted a halo about it. In the afternoon light clouds interrupted the observations some, but, generally speaking, all the observations were successful.

The entrance of Mercury on the sun's disk was well seen at Vassar Observatory and the first photograph taken at twenty minutes to eleven A. M.

OBSERVATIONS AT PHILADELPHIA—A REPORT TO BE PREPARED.

PHILADELPHIA, May 6, 1878.

Close observations were made in this city to-day, in common with those made at other places, of the transit of Mercury. A number of scientific gentlemen assembled in the Observatory, at the Boy's High School, to witness the planet in transit, but no one was permitted in the Observatory until the contact had been discovered and passed, except Professor Benjamin Snyder and his assistant. The first point of contact was made at some seconds past 10:12 o'clock A. M., which in astronomical reckoning would be May 5, 22h. 4m. Washington mean time. The planet made the first point of contact about eighteen degrees above the equator of the sun, and, pursuing a west southwest direction, emerged at a quarter before six P. M. some sixty degrees below the Equator. The data taken by Professor Snyder will be carefully computed and embodied in a report to be sent by him to the Washington Observatory.

OBSERVATIONS AT LEWISTON, ME.—THE WEATHER UNFAVORABLY CLOUDY.

LEWISTON Me., May 6, 1878.

Professor Fullerton, of Bates eological School, made observations of the transit of Mercury to-day. In the forenoon it was obscured and in the afternoon clouds interfered.

AT WEST POINT ACADEMY—SUCCESSFUL OBSERVATIONS OF THE TRANSIT.

WEST POINT, N. Y., May 6, 1878.

Observations for all four contacts of Mercury with the sun were successfully made to-day at the West Point Observatory.

THE OBSERVATIONS AT DETROIT UNSATISFACTORY ON ACCOUNT OF CLOUDINESS.

[BY TELEGRAPH TO THE HERALD.]

DETROIT, Mich., May 6, 1878.

The observations on the transit of Mercury made here to-day by the scientific corps of the lake survey were unsatisfactory. The first contact was rated the condition of the atmosphere being favorable, but shortly after clouds and haze interfered and the view of the small planet was obscured, much to the sorrow of the eager observers.

THE HERALD OF THE GODS.

The conditions proved highly favorably yesterday for the local telescopic-smoked window-glass observations of Mercury's transit. At the hour of first external contact old Sol beamed down from a sky slightly flecked with clouds, which served a good purpose in now and then shading his intense brilliancy, and enabling the thousands of amateur astronomers to bring their pieces of smoked glass to a proper bearing. The preparation of a piece of window pane for an astronomical observation is an undertaking requiring no little skill and circumspection. It is necessary, for instance, to use or rather burn an oleagenous substance in order to procure the proper degree of fattiness in the smoke. The glass must be big enough so that the scientist may not burn his own fingers in the operation of smoking, and, finally, the smoky side of the glass must be turned toward the heavenly body under observation, otherwise the observer is likely to get smudged with lampblack on the brow or nose. The delicate russet tints of some specimens of lager beer bottles are just the hues proper for making an observation through smoked glass. Unfortunatley the convexity of the surface exposed to the solar rays of a piece of broken bottle does not produce the desired effect on the vision. The angle of incidence being equal to that of reflection a scattering of the rays of light takes place, so that an observer using a bottle is likely to see several images and is likely to find it difficult to tell which is the right one. As exactness is essential to securing a valuable result it has been deemed advisable by modern scientists to abandon the use of the achromatic beer bottle for observations of the sun, and to substitute the simpler methods of smoking a piece of window glass.

After the first external and first internal contacts were observed Mercury was fairly on his travels over the sun's disk. He gradually drew from the centre of what might be termed the northwest quadrant of the solar disk toward and north of the centre. In this transit the planet looked like a small black spot buried in a sea of light, yet preserving its distinctness. If the planet had no atmosphere its appearance would be very much clearer. But, as it has a dense envelope of air or other gaseous matter about it, the solar rays were refracted through this atmosphere and tended to diminish the diameter of the planet, except to those looking at it through large and powerful telescopes. Drawing near noon the sky became overclouded and threatening, and the sun was frequently obscured, though his rays broke through many rifts in the vaporous veil overhead. During this period of cloudiness business with smoked glass and telescope was suspended in New York, but public curiosity did not abate in the least. Many people, who had not heard or read of Mercury's transit, could not make out what other people were at, staring up at the sun through a bit of sooty glass. Their curiosity was as to what these apparently crazy people were doing. Others watched the sun in vain for a sign, but saw nothing on his bright face. Several people were just sure that they saw them—"them" meaning some figures which the observer believed necessary to a properly conducted transit. So the day wore on and the clouds passed off, giving to the later hours a splendid opportunity for observing the final movements of Mercury.

The fact that Mercury can be seen with far less difficulty and without the intervention of smoked or other glass at numerous stated periods every year, and the additional fact that he could not be seen yesterday excepting through a powerful opera glass or telescope were no drawbacks to the intense desire of the many amateur moon starers—or, as the anagrammatists have it, astronomers—to see him during the time of his transit. Why they wished to see him it was hard to say, for they could calculate nothing from it. Even the five-inch telescope which Professor Peck aimed at the God of Day was not large enough to afford scientifically valuable views, but the rage of the people was none the less, and from every available roof and most of the street corners in the city "observations" were taken. As a fact, probably not one of those who had strained their necks and weakened their eyes really saw Mercury; but during the evening, strange to say, there was hardly a citizen in New York who had not "had an excellent view of the experiment." The gentleman who was some time ago arraigned in the Tombs Police Court as a vagrant, and who refuted the charge by explaining that his profession was smoking glasses for eclipses, yesterday made enough to keep him in bread and beer for weeks. The peripatetic scientist who performs on a big telescope in the streets, charging ten cents a squint, made also large profits, and everybody who owned or could borrow an opera glass was proud and happy.

Professor Peck, as was hinted, aimed the big Columbia College telescope at the sun from the vantage ground of the observatory on the college green, and curious students and grave professors in great numbers took observations at second hand, a large canvas screen being arranged in such a way that a reflection of the phenomenon was cast upon it. During the transit a number of young ladies from a neighboring seminary came on, not to see the students, but to view the transit. Two or three of them were late, and were very much disappointed when they were told that the Professor would by no means "repeat the experiment."

Mr. Rutherford, of Second avenue, has a glass of eleven inches which he had trained on the point of observation, and assisted by Professor Ingersoll, of Columbia College, took a number of valuable photographic views of the transit, which probably afford the only important scientific basis of calculation that was obtained in the city.

WATCHING THE CROSSING PLANET AT PROFESSOR DRAPER'S OBSERVATORY, HASTINGS, ON THE HUDSON.

In anticipation of Mercury's transit across the sun's disc several astronomers and scientists met on Sunday last at the observatory of Professor Henry Draper, Hastings, on the Hudson. Besides this gentleman there were present Professor George F. Barker, of the University of Pennsylvania; Professor J. W. Draper, of the New York University; Professor E. S. Holden, of the Naval Observatory, Washington, D. C., and Dr. Daniel Draper, director of the Meteorological Observatory, Central Park. Sunday night was spent in making sets of preparatory observations of some of the planets, and in getting all the instruments into a state of perfect working order. Yesterday morning the party, together with several other gentlemen, were on watch at the observatory by eight o'clock, and made the final adjustments of the apparatus about to be used.

THE DRAPER OBSERVATORY.

The observatory itself is composed of two domes enclosing circular spaces in which the great telescopes are mounted. Between the domes there is a photographic operating room, to the north and contiguous are a workshop well supplied with mechanics' tools and a beautifully fitted up hot air engine of two horse power, that drives the lathe upon which Professor Draper turned all the shafts and pinions, and cut the complicated wheel work used in mounting his great telescope. On the west side of the larger dome, which is twenty-two feet in diameter, is a transit room with instruments that are principally used in observing the sun's passage across the meridian. In the larger dome is mounted the unsurpassed twenty-eight inch reflector which took Professor Draper eighteen years to construct and fit up. This instrument, with its delicately adjusted clockwork, so arranged as to allow the glass to noiselessly follow the heavenly bodies in their course, is said to be far superior to the great telescope of Lord Rosse, which was at one time considered to be the best in the world. Next to it in point of merit is the instrument used in the Naval Observatory at Washington, D. C. Close along the surface of the tube of this immense telescope two others of less power are mounted in directions parallel to the axis of the tube. One of these instruments is a twelve inch reflector, the work of Mr. Alvan Clark, and the other is a valuable six-inch achromatic reflector. The two last named glasses were principally used yesterday, for the reason that the employment of a very great telescopic power would give to the planet observed too much the appearance of a dancing or "boiling" motion. In the smaller dome there is a very fine fifteen-inch Newtonian reflector, which was mostly used by Professor Barker. Professors Draper and Holden took their observations from the other two instruments. In a corner of the room adjoining the larger dome a chronograph is fitted up. The office of this instrument, aided by a chronometer having a pair of electric wires to connect it with a glass pen, is to enable the observer to measure the time of any observation down to the hundredth part of a second. A camera ten inches square was fastened to the face of the tube of the great reflector, and had an instantaneous shutter, whereby the exposure of the sensatized glass to the light was regulated, and in this way the position of the planet photographed from time to time as it made its course across the sun's disc from right to left. So delicately was the photographic apparatus arranged that an exposure of 1-1,000 of a second in duration could be obtained.

THE WEATHER CONDITIONS.

The weather was, upon the whole, favorable for the important work on hand; the fore part of the day was clear, and the latter part alternately clear and cloudy. The atmosphere, though apparently undisturbed and beautiful was, in the forenoon, charged with an amount of gaseous vapors and caloric that made it extremely difficult to get correct observations of the time of the planet's first contact with the sun's limb.

THE TRANSIT.

The predicted time for the first contact was, according to Washington mean time:—

I. 10h. 5m. 59 sec.

II. 10h. 9m. 6 sec.

The difference between the first and second times of contact, as above given, shows the approximately calculated time occupied by the planet from the instant of its first contact with the sun until that when its outer limb comes opposite that of the sun; or, in other words, the time occupied by Mercury in traversing on the sun's disk, a distance equal to his own apparent diameter. At the instant of first contact the planet was "boiling;" that is, jumping about on the sun's surface for a distance about equal to three times his own diameter, and therefore the exact time of first contact could not be accurately ascertained. It may be confidently stated, however, that the error between the estimated and the real time of first contact does not exceed half a minute. It is also certain that the difference between the predicted and the real time of contact was not more than half a minute. As there was no time yesterday to compare, reduce and arrange the figures obtained the exact time of contact could not be given. During the observations the sun's disk was brought to the eyeglass of the telescope and shown on a reddish colored glass, with the planet not larger in appearance than a grain of mustard seed, dancing around so as to take the sharpest vision to define its diameter. A moment's inspection of this unsteady little globule showed at once how difficult it was to get the instant of his first contact with the sun, on account of the vibratory motion imparted to him through the unfavorable condition of the atmosphere.

PHASES OF THE PHENOMENON.

Let the circular part of a twelve-inch clock face represent the sun, then a very small pea on its surface will bear about the same proportion to it that the image of Mercury did yesterday to the sun's disk. Following this illustration a good idea may be obtained of the planet's course across the sun if we suppose that he commenced to interpose himself between us and the great luminary at a spot which would be properly indicated as half-past four o'clock on the clock dial. From this point the course of Mercury was upward, in a slightly curvilinear direction, toward eight o'clock, between which and half-past eight he went off the sun's disk. While the planet was coursing his way gradually over the surface of the sun eighteen photographs of him were taken by Professor Draper, several of the negatives being very good ones. The photographs are on a plate eight by six inches, and show a picture of the sun five inches in diameter with the little dark speck of a planet in its true position at the time of exposing the plate. The negatives were timed by a chronometer making sidereal time, which is two hours and fifty-four minutes earlier than mean time. The following are the different times at which the pictures were made:—

	H. M. S.		H. M. S.
1	1 23 20	10 (cloudy)	5 10 24
2	1 32 9	11	5 36 54
3	1 40 57	12	Not exposed
4	1 54 11.5	13	6 5 57
5	2 2 46	14	6 14 39
6	2 41 44	15	6 22 43
7	2 51 7.5	16	6 42 6
8	3 21 5	17	6 54 35.5
9	5 1 1	18	7 59 58.5

To aid one oet er in fixing the position of the planet the sun's disk was marked with a parallel line of right ascension, which showed the course of Mercury to be all through in the sun's northern hemisphere.

THE CLOSING OBSERVATIONS.

When the planet was about to emerge from the sun the atmospheric conditions were allowed to be very good, and by using small powers on the telescopes its well defined outline could be seen in considerable detail. While taking the last observations Professors Draper and Holden were huddled close together on the step ladder close to the instruments, each with an eye intent upon the images reflected in the eyeglasses. Dr. Draper was perched near them on another step-ladder and Professor Barker was at their feet watching the reflection of Mercury on the ground glass of the camera, where it had been projected by the great telescope. Mrs. Henry Draper had her stand by the chronometer, beating off the seconds and repeating them. The other parties grouped themselves around the circle, impatient to know, if possible, the results of the observations. The predicted time for the planet to emerge from the sun was (according to Washington, D. C., mean time), as follows:—

III. 5h. 37m. 18s.

IV. 5h. 40m. 25s.

The above observations, like the two that were taken when the planet was entering on the sun, were designed to show but inversely the time of first and second contact between the circumferences of the two bodies. Professor Draper was well satisfied with the concluding observations; he had observed the last contact to within 1-90 of the planet's diameter, which he ascertained to be three minutes on arc of the circle. Professor Barker's calculated time (approximately reduced) was understood to be—

III. 5h. 35m. 33s.

IV. 5h. 37m. 45s.

In the corresponding third and fourth observations (of last contact) the results registered by the other telescopes were ascertained to be:—

SIXTEEN-INCH REFLECTOR.

III. 5b. 33m. 13s.

IV. 5h. 36m. 18s.

SIX-INCH REFLECTOR.

III. 5h. 33m. 20s.

IV. 5h. 36m. 20s.

From the foregoing it will be perceived that the exact times of exterior and interior contact have not yet been reduced so as to give the data now printed the force of official authority; but the figures are within a small fraction of being the right ones.

The appearance of Mercury on the sun was black, but not so dark as had been expected.

No bright spots were observed on the dark disk of Mercury, nor was there any appearance of a satellite near the planet. No solar spots were observed; neither were solar protuberances observed.

LOCAL OBSERVATIONS BY PROFESSOR PARKHURST—A COMPLETE EXPLANATION OF THE PHENOMENA OF THE TRANSIT AND THE OBJECTS OF ASTRONOMERS IN OBSERVING IT.

TO THE EDITOR OF THE HERALD:—

The great popular interest in the transit of Mercury, which has taken place to-day, arises from its repeating, on a reduced scale, the phenomena of the transit of Venus, which will be visible here in four years from next December. In the transit of 1874, the only one that has occurred within the lifetime of this generation, astronomical expeditions were sent out by the principal civilized nations to those parts of the world where it would be best seen, and from that day to this many computers have been at work reducing the observations then taken, without having yet gleaned from them all the information which they could give with regard to the earth's distance from the sun, the elemental measure of the planetary spaces.

A phenomenon precisely similar in kind is to-day expected to yield results entirely different in their character. In observing the transit of Venus the object is to determine the sun's distance from the parallax, and this can best be done from observations of a planet which is near us, which has as large an orbit as possible and from points on the earth's surface where the parallax will be greatest. On the contrary, in the observation of the transit of Mercury, whose distance from us is so much greater and whose orbit is so much smaller, the main object is to determine the absolute position of the planet in its orbit. This planet is so difficult of observation, and its orbit is so imperfectly known, that there is a difference of about seventy seconds between the British and the American predictions of the time of the transit. The position of the planet can best be obtained by observation from points on the earth's surface where the parallax is least. The very best position for observing either contact would be that at which the sun would be vertical at the time of the contact, for there would be no parallax. But as there is an interval of more than seven hours between the first and the last contact, no one place can give this condition, even approximately, for the whole transit. Any point within the United States will divide the interval between the ingress and the egress, showing the whole transit well without leaving home, therefore American astronomers have had to-day as good an opportunity to reach useful results from the observation of the transit as if they had travelled thousands of miles to witness it.

OBJECT OF THE OBSERVATIONS.

The primary object of the observations has been to determine the position of Mercury in its orbit; but the main object has been to determine the position of the orbit itself; and this, not for its own sake, but for the purpose of ascertaining whether there is a planet revolving around the sun interior to the planet Venus. The search for this interior planet, which has been by common consent named Vulcan, has proved in vain. Astronomers have come to the conclusion that it is almost impossible that such an interior planet could exist without having been long since discovered and having had its orbit fixed. Leverrier considered it probable that such a planet does exist, and urged a special search for it, relying to a great extent upon the facts that the perihelion of the orbit of Mercury advances more rapidly than can be accounted for by the action of the known planets, indicating the existence either of an interior planet or of some zone of planets, or meteorites or other matter revolving around the sun within the orbit of Mercury. The question of to-day, then, is the verification of the fact of the actual amount of the advance of the perihelion of the orbit of Mercury.

THE PLANET'S ORBIT.

It is to be remembered that the orbit of a planet is not a material ring; it is simply the path through which the planet moves, having no more actual existence than the path of a bird in the air. The action of the planets is not upon the orbit, but upon the planet itself. The change of the orbit is as if a bird, being attracted by some object, should change its course and fly in a different direction. The path of Mercury is very nearly a circle, but the sun is not in its centre, so that at a certain point Mercury is nearer the sun than at any other; but it is found that the next time that Mercury reaches that point it moves forward about 246 miles, or one-thirteenth of its diameter, further before it begins to recede. As Mercury is approaching its aphelion the effect of a large motion if the perihelion would be to cause the planet to be further advanced in its orbit, and therefore to hasten the time of the transit. If, therefore, Mercury should be found to-day, upon a comparison of all the observations, to have appeared earlier than can be accounted for by the action of the sun and the known planets it will make it probable that there is other attracting matter yet undiscovered.

We are not to conclude that this attracting matter is a planet. The amount of matter which may exist in the protuberances and in the corona around the sun, of which we may hope to learn more in the total eclipse of the sun next July, or in the Zodiacal Light, or in streams of meteoric matter, such as give rise to meteoric showers, may be all that is required to account for the motion of Mercury.

OBSERVATIONS THROUGHOUT THE COUNTRY.

In accordance with the invitation of the National Observatory amateur observers have to-day, doubtless in very many places, carefully observed this transit. At some the clouds must have intervened and prevented recording the times of ingress and egress; but here, although the sky was covered with clouds most of the day, we had a clear sky at both of these important times. Our only trouble was the commotion of the atmosphere, preventing a distinct image of the planet. The modes of preparation have been various, but I will describe that which I adopted, the more fully because I believe it will be the best method for amateur observers to adopt in the observation of the approaching transit of Venus.

It has been my experience from careful comparison that I can obtain a more satisfactory view of the sun by receiving its image upon a screen than by direct vision. The screen I employed was about a foot in diameter and was supported by a wire framework. By a prism the light was reflected at right angles, so that the screen did not face the sun, but stood with its edge toward it. This made it easy to exclude the direct sunlight from falling upon the screen without the necessity for enclosing it, as is sometimes done, in a pasteboard funnel. Although not necessary, and almost useless in the afternoon from the high wind, I provided curtains to exclude from the observatory nearly all the direct sunlight around the telescope.

Reducing the aperture of the object glass to eight inches and applying a power sufficient to make the image of the entire sun a circle of forty inches in diameter and the image of Mercury one-quarter of an inch, as shown in the above diagram, the clockwork motion kept the telescope pointed at the sun, with that part of the eastern limb of the sun where Mercury was expected to appear near a line drawn across the screen tangent to the limb. There were three observers at my observatory in Brooklyn and an assistant to count the time from the chronometer. The computation from the formula in the American ephemeris indicated that the external contact would take place 10h. 26m. 36s., New York time, there being a probable delay of six or eight seconds before the indentation would be sufficient to be perceptible. At 17m. 4s. we all saw the indentation upon the limb of the sun, clear and distinct, notwithstanding the tremulous motion caused by the atmospheric disturbance, although at that moment the length of the indentation did not appear to exceed four seconds of space. As the planet entered further upon the disk the tremulousness seemed to increase, and the "black drop," so often seen in transits of Venus, became plainly visible before the internal contact. At 19 min. 36 sec. two of the observers saw the first undulation of light across this black drop, but we did not catch another glimpse of this light until seven seconds later, and in the meantime the third observer, at forty one seconds, caught the first distinct glimpse of the light. Shortly after the clouds came up and covered the sky, forbidding further observation, except by occasional glimpses, during most of the day.

A LOCAL VIEW.

At times, as the clouds passed away, Mercury could be seen to have around it a fringe which seemed to me decidedly darker than the surface of the disc of the sun; but others seeing the same fringe, described it as yellow, and brighter than the disk. As the sun descended toward the horizon the prismatic spectrum from the refraction of our atmosphere was so strong, causing a bright red fringe on one side and a bright blue fringe upon the other, as to make it impossible to see the other which I had noted earlier. At the time of the egress it seemed almost useless to attempt observation, from the very great tremulousness of the image of the planet. Nevertheless, the three observers each made his independent record of the internal and external contact, agreeing much better than we expected. We made the internal contact 5h. 46m. 9s., and the external contact 48m. 49s. The prediction of the American Ephemeris would be for the last contact 51m. 6s. At this last internal contact, the black drop was again plainly seen.

Comparing the observed times with those derived from the Ephemeris there are several points to be noted. Instead of the time of the ingress and of the egress being 3 minutes 7 seconds we made it less than 2 minutes 43 seconds, and it did not seem possible that the difference of 24 seconds arose from our not seeing the indentation soon enough in the morning or late enough in the afternoon. Again, the duration of the transit we made less than that predicted, which would seem to indicate a path further to the north than was expected. And, finally, the whole transit appeared to be earlier than predicted, the predictions being based upon tables as early as 1848, and therefore before the later investigations of Leverrier; so that if the observations elsewhere correspond with those which we have made, and if I am right in my interpretation of the results, the "result of Le Verrier, that the action of the perihelion of Mercury is much greater than that due to the action of the known planets," is sustained. HENRY M. PARKHURST.

NEW YORK, May 6, 1878.

SUSPENSION OF MANUFACTURERS.

HAVERHILL, Mass., May 6, 1878.

William H. Carleton & Co., shoe manufacturers, suspended this morning, with liabilities of about $60,000.

L. Johnson & Co., shoe manufacturers, suspended this afternoon, with liabilities of from $100,000 to $200,000.

RUSSIA'S DESIGNS.

LATEST ARRIVAL OF RUSSIAN AGENTS IN AMERICA—WHAT ARE THEY AFTER?

As announced in the HERALD of yesterday in a despatch from Baltimore, three special agents of the Russian government arrived on the steamship Germanic from Liverpool May 3 and proceeded at once about their business, which is believed by those best informed to relate to transacting the purchase and fitting out of vessels for objects of privateering. These three agents were Captain A. Grippenberg, of the Russian Navy, brother of Count Grippenberg, now on board the Cimbria at Southwest Harbor, Me., and holding, as it is generally presumed, the sealed orders of the Russian government in regard to operations from here, Mr. H. W. Hunt, of Boston, a gentleman who has spent some time in Russia and executed several important contracts for the Czar, and Mr. Paul Butler, son of General B. F. Butler, who, it is alleged, stands high in the councils of the Russian government. A HERALD reporter called at the Everett House last evening and with the aid of a clerk, whose name it is not necessary to give, interpreted the entry on the register for Saturday last of "W. McKay and two friends, Philadelphia, rooms 152 and 153," to mean Mr. William McKay, son of the great shipbuilder, of Boston, Donald McKay, and Captain A. Grippenberg and Mr. W. H. Hunt. Mr. Paul Butler signed his name in full underneath. The latter remained behind while the former party proceeded the same evening by the nine o'clock train to Washington. Their sudden leavetaking of New York was said to be on account of a despatch from the Russian Minister in Washington. Captain Kennedy, of the Germanic, on which steamer these gentlemen came over, knew nothing of their character, nor did any of his officers, even including the purser, who is ordinarily supposed to know everything about the passengers the steamer carries. When, however, they discovered yesterday who these people were they were endless in recalling incidents of the voyage where the Russian agents made themselves couspicuous, and nobody ever suspected their designs. They were foremost in the usual game of quoits on deck, and in the smoking room their merriment excelled all the rest. Between the purser and Captain Griffenberg a strong intimacy sprung up, though if the purser, who is a true John Bull, had known the precise mission of the Captain at the moment there might have been a summary end to their *entente cordiale*.

A FINE LOOKING FELLOW.

He took great pains in showing the Captain and Hunt over the vessel, the former having been introduced to him by the latter as an officer of the Swedish government going to America chiefly for the benefit of his health. "Well," said the purser, "he was really a fine looking, cordial fellow that you could not help liking. His style of address was of that off hand character that takes so much with Americans and Englishmen. Nothing 'stuck up' about him, as you people say. His English was not very plain, but you took such an interest in the man from his appearance and behavior that you readily understood all he said or meant to say. He went all over the ship, taking a particular interest in its entire construction and asking about the whole minutiæ of her cost for engines, coal, feed of furnaces and all these things that a man contemplating the building of a line of steamers might be supposed to inquire about."

It was noticed during the voyage that Captain Grippenberg, Mr. Hunt and Mr. Butler were constantly together, and their relations to the Russian government were such that there is hardly a doubt but that the scheme of privateering is more or less in their hands.

SIGHTING HAVANA STEAMSHIPS.

What gives additional color to the story that Russia has been at work here with the design of striking a blow at the vast commerce of England, in which she can do more damage to her than by any operations on land, is the fact that a Russian agent, who declined to give his name, visited a short time ago the office of Messrs. Alexandre & Co., the owners of the fine line of boats that ply between this city and Havana, and made a proposition for the purchase of such as were available. He simply said he wanted to buy a class of vessels of great speed. Mr. Alexandre was ready to sell if the prices offered for his ships were of the right figure. He offered to sell the City of New York, 1,715 tons, the City of Vera Cruz, 1,874 tons; the City of Merida, 1,492 tons, and the City of Mexico, 1,200 tons. The Russian agent was agreeably disappointed in finding Mr. Alexandre so freely inclined to dispose of his ships, because to him the matter of price was of small moment and he liked the ships because they were wooden, and as he expressed it, more easily repaired in case of accident than if they were built of iron. Mr. Alexandre said that most of his vessels average thirteen knots an hour and with slight changes would make quite formidable privateers—as much so as the Alabama or Florida. In regard to the steamers owned by other companies and sailing out of this port, all that can be said is this, that if there is any party in the market for steamships they will find willing sellers to willing and liberal buyers, without anything being intended as a violation of the neutrality laws.

ENGLAND'S INDIAN TROOPS.

OPINION OF A BRITISH OFFICER WHO HAS SERVED IN INDIA REGARDING THE VALUE OF THE NATIVES.

LEGGETT'S HOTEL, May 6, 1878.

TO THE EDITOR OF THE HERALD:—

Will you allow me a small space in your columns to say a word for the native soldiers of Her Majesty's army in India, who I see treated by a writer in yesterday *Dispatch* as half savages and a doubt expressed whether they can stand a European climate. Their fighting powers are contemptuously compared by the writer to that of the French zouaves and the Turcos Apart from the ignorance of the man, who seems to suppose the zouave to be anything but what he really is, a Frenchman, I cannot allow the remarks on this Indian army to pass me without a protest. I have had the honor to serve Her Majesty as an officer for many years, eleven of which were served in India, where I was in garrison with Her Majesty's native troops, and I can safely say that a finer body of men for drill, discipline and fighting qualities I have never seen. The two regiments of cavalry now on the seas on their way toward Malta are as fine cavalry as there are in the world. As swordsmen and horsemen they cannot be surpassed, while they are magnificently mounted and well equipped. I feel sure that the able General, Lord Napier of Magdala, who is nominated to command any army England may put into the field (should she unhappily have to go to war) has not only consented to, but has urged the employment of the native army, with whom he has served for nearly forty years, and in whose loyalty and courage he knows he can depend, and who I believe will prove, when led on by their European officers, as good troops as any in the world. There need be little fear on the score of climate. Indian climate alone offers sufficient varieties of temperature to test the endurance of the soldiers. In the North of the Punjab the soldiers in the winter are clothed in sheepskin coats, much the same as they would wear in winter in Europe. The way in which the ill clothed ship Lascars brave out the cold when they are in European seas is a sufficient proof that the natives can stand the winter. Your obedient servant, W. WYNDHAM.

TERRIBLE TRAGEDY.

A BRAVE MINER STONED TO DEATH WHILE DEFENDING AN OLD MAN AGAINST RUFFIANS.

SCRANTON, May 6, 1878.

John Paull, a miner formerly living in Dunsmore, one of the suburbs of this city, died this morning from the result of injuries sustained on Tuesday last, when he had his skull battered in by stones while defending an old man from the fury of a gang of ruffians. This terrible scene was enacted at five o'clock in the afternoon on the open street, in front of Dupuy's hotel at Dunmore, and was witnessed by forty men, too terror stricken to interfere. The affray originated in Dupuy's hotel. A desperado, named Jack Costello, and another named McHugh, entered and called for drinks. They refused to pay for them and spoke threateningly to the barkeeper, a feeble old man named Layton. Costello drew a razor from his pocket and pushed his way into the hotel parlor, where about half a dozen men were seated. His presence created a panic and most of the party hastened from the place as quickly as possible, while others remonstrated with him and succeeded in prevailing on him to put away the razor in his hip pocket.

LAYTON ATTACKED.

Costello and his companion went into the street again, and finding the old barkeeper standing outside the door they attacked him, endeavoring to throw him over an adjoining fence. At this juncture John Paull, a peaceable miner living in the neighborhood, who came to the drug store to get medicine for one of his children who was dying with scarlet fever, interfered, requesting the ruffians to let the old man alone.

A BRAVE MAN'S FATE.

Then they attacked Paull and a terrible fight took place. He knocked them down repeatedly, and, although battered with stones, never fell once during the *melée* himself. About half a dozen of Costello's companions joined in the bloody assault, which lasted nearly half an hour, and poured a shower of stones upon Paull. The fight occurred in the middle of the street and was carried on from one end of the block to the other. All this time Paull was alone. At last Paull staggered into a neighboring house, and was not there many minutes before he was seized with convulsions.

A CRUSHED SKULL.

The doctors found the skull fearfully battered in a little above the left ear, another wound appeared above the right and the back of the head was also gashed and torn. Several pieces of the skull were removed by Dr. O'Brien, and it seemed as if Paull might live.

A STRICKEN FAMILY.

To add to his great sorrow, however, the sick child for whom he had gone on an errand when attacked died on Friday, and two other children were seized with the fever, which he himself caught a little before his death. His wife has also since been attacked by the fever, and is not expected to recover.

Paull's murderers made their escape on the night of the tragedy.

THE STATE CAPITAL.

THE SENATE VENTILATING THE BILL OF THE SOCIETY FOR THE PREVENTION OF CRIME—VETOES BY THE GOVERNOR—AN ACT TO ABOLISH THE INSURANCE DEPARTMENT.

[BY TELEGRAPH TO THE HERALD.]

ALBANY, May 6, 1878.

The uninteresting character of the proceedings of the Assembly to-night is regarded as a lull before the storm. The important movement against the Governor's veto of the Bonded Indebtedness bill, the Conference Committee on the amended Public Burden's bill and the effort to secure a new code commission are all promised as part of to-morrow's work. The energy of the members was conserved to-night in order to be able to meet these emergencies to-morrow.

PREVENTION OF CRIME.

The Senate held an animated session and consumed most of the evening in debate on the bill incorporating the Society for the Prevention of Crime. On motion of Senator Ecclesine section 8, which reads:—"One-half of the fines and one-half of the penalties collected by the aid of or through the instrumentality of the said society or its agents for violations of the law shall accrue and be paid for the benefit of the said society," was stricken out. A motion to reconsider this vote gave rise to a debate, which lasted until eleven o'clock, and was finally lost. Ecclesine sought to have Kings and New York counties exempted from the operation of section 9, which reads, "The provisions of this act shall be general within the boundaries of the State," but the effort failed. During the debate it was explained that if the society accumulated one-half the moneys collected from fines for violation of the Excise law, it would in twenty years be a more powerful organization than the East India Company.

VETOES.

The Governor sent to the Senate two vetoes this evening, one of the bill extending the time for the sale of the Genesee Valley Canal and of the bill authorizing the County Judge of Allegany to appoint four constables.

THE INSURANCE DEPARTMENT.

The following is a copy of the bill of Mr. Sessions, introduced in the Senate to-night, abolishing the Insurance Department:—

SECTION 1.—The act entitled "An act to establish an insurance department," passed April 15, 1859, and section 1 of the act of April 20, 1861, and the act to provide for the incorporation of life and health insurance companies, passed April 17, 1862, and the act of April 25, 1871, and the amendatory act of May 22, 1873, are all hereby repealed.

SEC. 2.—The act authorizing life insurance companies to make special deposits of securities in the Insurance Department, to require special reports of said companies, passed April 24, 1867, and the act of May 18, 1869, are hereby repealed, saving all rights which have accrued and all trusts and obligations which have been lawfully incurred under such acts, and for the protection of such rights and the fulfillment of such trusts the Treasurer of the State is authorized to take possession of all deposits and securities hitherto made in the Insurance Department under such acts, and to hold such securities in trust for the use and purposes for which they were deposited, exercising the same powers and performing the same duties with regard to such deposits as are assigned by the said acts to the Superintendent of the Insurance Department.

SEC. 3.—Whenever by any law not repealed by this act, any insurance company is required to deposit any securities or money in the Insurance Department, such deposit is hereby required or permitted to be made in the Treasury of the State, subject to all the conditions and provisions of such law, and the Treasurer is hereby authorized and required to receive such deposits and to perform all the duties in regard to them which under such laws might have been performed by the Superintendent of the Insurance Department.

SEC. 4.—Whenever by any law of the State not repealed by this act, any powers are granted to the Superintendent of the Insurance Department or any duties imposed upon such Superintendent other than those assigned by sections 2 and 3 of this act to the State Treasurer such powers are hereby granted to and such duties imposed upon the Secretary of State.

OWEN MURPHY'S TREASURE.

Speaker Husted introduced a bill which will no doubt delight the hearts of many of the retail liquor dealers of Gotham. It provides that the Mayor of New York be empowered and authorized to receive moneys paid to the Excise Commissioners of the city during the year 1877, by persons applying for licenses and to whom no licenses have been granted, from those who now have the custody of such moneys, and that he be authorized to distribute the same equitably to and among the parties who shall in his judgment be entitled to the same. The bill was read a third time and referred to the Committee of the Whole.

SEVENTH REGIMENT VETERANS.

The bill incorporating the veterans of the Seventh regiment was passed.

JUDGES' COMPENSATION.

The passage of the bill directing the Boards of Supervisors of the several counties in the Third Judicial district to annually appropriate the sum of $10,000 to be applied to the payment of salaries of justices of the Supreme Court of the district in addition to the compensation now allowed by law, was moved, but as it received only sixty-one votes it was declared lost. Mr. Bergen made a motion that the vote be reconsidered and that the motion be laid on the table. Carried.

RECEIVER'S REPORTS.

Mr. McDonough's bill concerning receivers was passed to-night. It provides that all receivers of corporations heretofore appointed by order of any court or judge, and not discharged from the duties of their respective trusts, and all receivers that may hereafter be so appointed, shall at least once in every six months during the continuance of their respective trusts file with the Secretary of State, under oath, a report of their proceedings as such receivers; the first report to be made by each receiver shall contain a particular description of all property that may have come into his possession as such receiver, and each succeeding report shall contain a statement of the property remaining on hand at the time of the last preceding report, and in addition thereto, a statement of all property that may in the meantime have come into his hands as such receiver. Such reports shall also contain a statement of all dividends that have been paid during the period covered by the report, a statement of all disbursements or payments made during such period and what disposition has been made of any property that may have come into his possession as such receiver, together with the reason and authority for such disbursements, payments and disposition of property. Any receiver failing to make the report provided for shall be removed by the Court or Judge making the appointment upon the application of any stockholder, bondholder or creditor of the corporation of which he may be the receiver. Any receiver wilfully making any false statement in any of the reports shall, upon conviction, be adjudged guilty of perjury in the first degree, and shall be punished accordingly. The Secretary of State shall, during the month of January in each year report, to the Legislature what receivers have complied with this act, together with a copy of all the reports made by said receivers.

At ten o'clock Mr. Grady, of New York, offered a resolution concerning the memory of the late Feliz Murphy, ex-member of Assembly from the Second New York district, and asked that out of respect to deceased the House adjourn, which was carried.

CLOSING ITS DOORS.

THE COMMERCE INSURANCE COMPANY ABOUT TO WIND UP ITS AFFAIRS.

A meeting of the Board of Directors of the Commerce Insurance Company of this city was held last week at the company's office, No. 175 Broadway. The advisability of closing the doors of the organization was then discussed, and most of the gentlemen present were of the opinion that the existence of the company should be terminated. The reason for this movement was the unsettled state of the insurance business in the past, the depression of the present and the unfavorable outlook of the future.

The company was organized in 1859. Its officers are Duncan McDougall, president, and William E. Hoxie, secretary. The last statement was made on January 1, 1878. The capital was stated at $200,000, the assets at $240,379 and the surplus at $2,008. Mr. McDougall has been president for four years. He was formerly a stockholder.

A HERALD reporter called upon Mr. McDougall at his residence last evening. That gentleman said that for some time past the company had been going quietly along, the times not permitting any profits to be made. It had been paying its stockholders out of the surplus; but this had now dwindled down, and it was thought advisable to close the company's doors. A law lately passed enabled the directors to consolidate with another company if they chose, and perhaps this consolidation might take place. There were two parties among the directors, one advocating the closing of the company's doors the other favoring a consolidation with some stronger company. The former, comprising many of the heaviest stockholders, were in the majority, and hence consolidation was only a possibility. The present condition of the company's affairs, Mr. McDougall added, was about the same as when the statement was made in January last. There was no defaulting and no losses to stockholders. The company was solvent and perfectly able and willing to pay all it owed. The stockholders knew they would realize the full amount they had invested, and this led them to desire the closing of the organization rather than its continuance by consolidation. Were the company able to pay only a part of its indebtedness there would be the desire on the part of the stockholders to join with another company in the hope of regaining the full amount invested.

THE ASSETS.

The assets were very good. The greater part were in government bonds and the rest in a mortgage which was worth in the neighborhood of double the amount. Mr. McDougall further said this action of the directors was but natural, as very few of the insurance companies were prospering, their dividends being paid out of surpluses got together in brighter times than the present. Should it be definitely decided upon to close the company's doors a small amount would cover the expenses of the winding up. The company's business was almost entirely local and its risks were slight. It had paid a five per cent dividend in every six months until within the last six months, except on one occasion—viz., the Boston fire, when the company lost heavily, and an assessment was made and promptly paid by the stockholders. To sum up, the winding up is an outcome of the hard times, but the doors will be closed with no one likely to be a loser.